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The effects of growth hormone on body composition and physical performance in recreational athletes: a randomized trial.

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BACKGROUND:

Growth hormone is widely abused by athletes, frequently with androgenic steroids. Its effects on performance are unclear.

OBJECTIVE:

To determine the effect of growth hormone alone or with testosterone on body composition and measures of performance.

DESIGN:

Randomized, placebo-controlled, blinded study of 8 weeks of treatment followed by a 6-week washout period. Randomization was computer-generated with concealed allocation. (Australian-New Zealand Clinical Trials Registry registration number: ACTRN012605000508673)

SETTING:

Clinical research facility in Sydney, Australia.

PARTICIPANTS:

96 recreationally trained athletes (63 men and 33 women) with a mean age of 27.9 years (SD, 5.7).

INTERVENTION:

Men were randomly assigned to receive placebo, growth hormone (2 mg/d subcutaneously), testosterone (250 mg/wk intramuscularly), or combined treatments. Women were randomly assigned to receive either placebo or growth hormone (2 mg/d).

MEASUREMENTS:

Body composition variables (fat mass, lean body mass, extracellular water mass, and body cell mass) and physical performance variables (endurance [maximum oxygen consumption], strength [dead lift], power [jump height], and sprint capacity [Wingate value]).

RESULTS:

Body cell mass was correlated with all measures of performance at baseline. Growth hormone significantly reduced fat mass, increased lean body mass through an increase in extracellular water, and increased body cell mass in men when coadministered with testosterone. Growth hormone significantly increased sprint capacity, by 0.71 kJ (95% CI, 0.1 to 1.3 kJ; relative increase, 3.9% [CI, 0.0% to 7.7%]) in men and women combined and by 1.7 kJ (CI, 0.5 to 3.0 kJ; relative increase, 8.3% [CI, 3.0% to 13.6%]) when coadministered with testosterone to men; other performance measures did not significantly change. The increase in sprint capacity was not maintained 6 weeks after discontinuation of the drug.

LIMITATIONS:

Growth hormone dosage may have been lower than that used covertly by competitive athletes. The athletic significance of the observed improvements in sprint capacity is unclear, and the study was too small to draw conclusions about safety.

CONCLUSION:

Growth hormone supplementation influenced body composition and increased sprint capacity when administered alone and in combination with testosterone.

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Comment in

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Comment on

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